FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

- COMPLEX PROTECTION ENVIRONMENTS -

April 5-7, 2022
Union Station Hotel
St. Louis, MO

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

JOB BRIEFING

What: Complex Protection Environments	**CPR Certified:** Adam Shepherd
Who: TBD	**AED Location:** By Stairs
When: 10:00am CT	**First Aid Kit Location:** Front Desk
Where: 1820 Market St, St. Louis, MO 63103 (Grand Ballroom E)	**Fire Extinguisher Location:** Hallway
Hospital Name: Barnes Jewish Hospital	**Hazards:** Chairs, Bags
Hospital Address: 400 S Kingshighway Blvd, St. Louis, MO 63110	**Evacuation Plan:** Immediate Left Out
911 Caller: Adam Shepherd / TBD	**Active Shooter:** Run, Hide, Fight
911 Greeter: TBD / Adam Shepherd	**Cell Phones:** Vibrate or Silent

PREFACE:

This presentation is opinion in nature as there are many ways to approach on-track safety. The following is an intricate look into complex protection environments and general best practices.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 01

COMPLEX PROTECTION ENVIRONMENTS - PART 01

SCENARIO:

A work group needs to perform all day maintenance activities at a public at-grade road crossing on a controlled single main track and has elected to utilize Track Bulletin Form B as their method of On-Track Safety.

QUESTION:

Which side of the track does the work group place their Conditional Stop Red Boards?

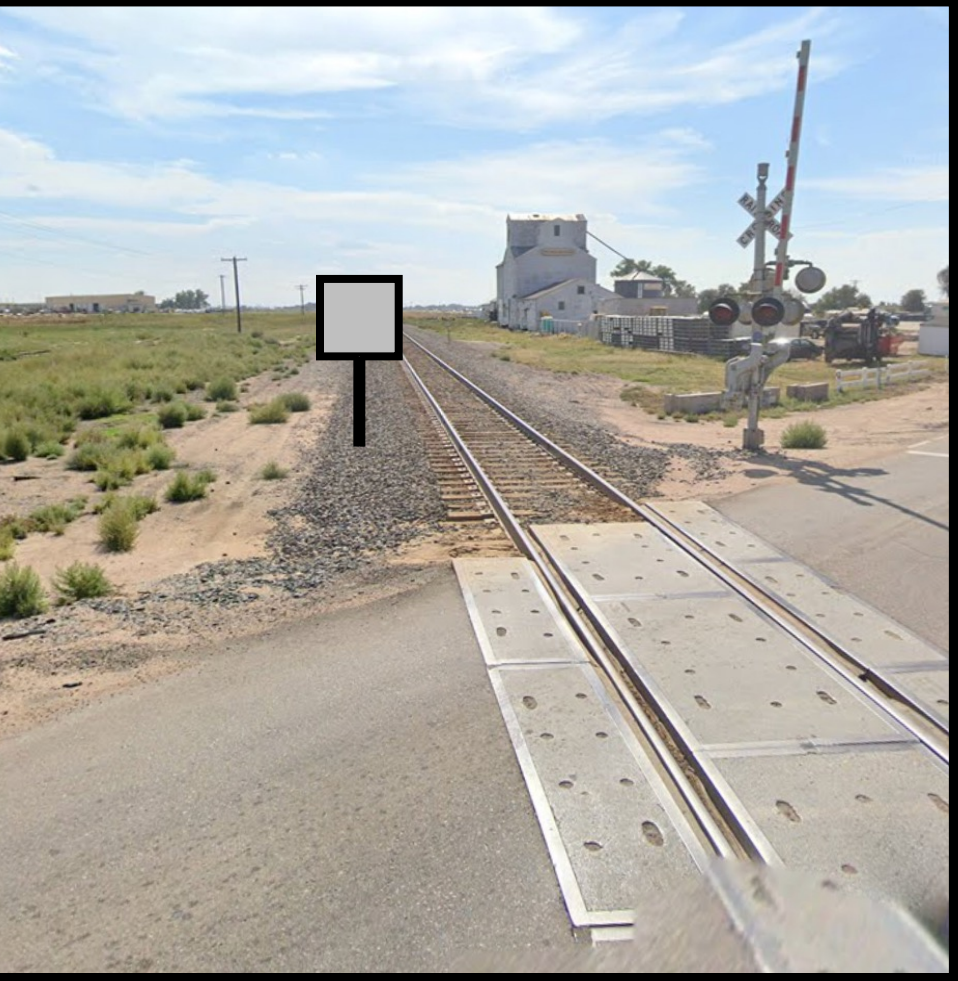
COMPLEX PROTECTION ENVIRONMENTS - PART 01

EAST

WEST

COMPLEX PROTECTION ENVIRONMENTS - PART 01

EAST



WEST

ANSWER 01:

The Conditional Stop Red Boards will always go on the left hand side of the track no matter which way you are facing in single main track territory (permitting there are no obstructions).

ANSWER 02:

Likewise, the Conditional Stop Red Boards will always face away from you regardless how many tracks are involved.

ANSWER 03:

The only exception you will find is if your working limits are wider than the crossing with which you are working, i.e. you place boards at another crossing. That being said, the same principles apply, however, care should be taken with regards to situational awareness.

BEST PRACTICE 01:

Keep Working Limits only as large as necessary. Unless performing track maintenance over a large area, it is typically unnecessary to have wide Working Limits.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 02

COMPLEX PROTECTION ENVIRONMENTS - PART 02

SCENARIO:

A work group needs to perform all day maintenance activities at a public at-grade road crossing on a controlled double main track and has elected to utilize Track Bulletin Form B as their method of On-Track Safety.

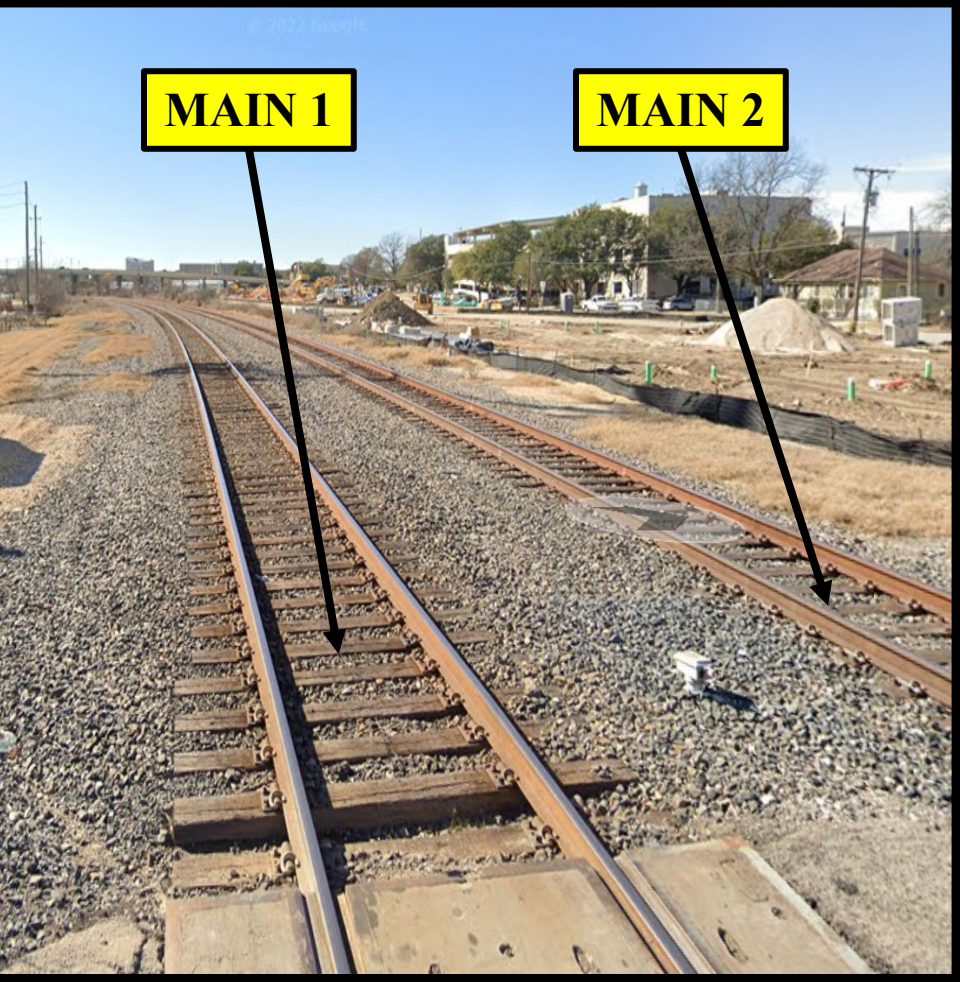
COMPLEX PROTECTION ENVIRONMENTS - PART 02

QUESTION:

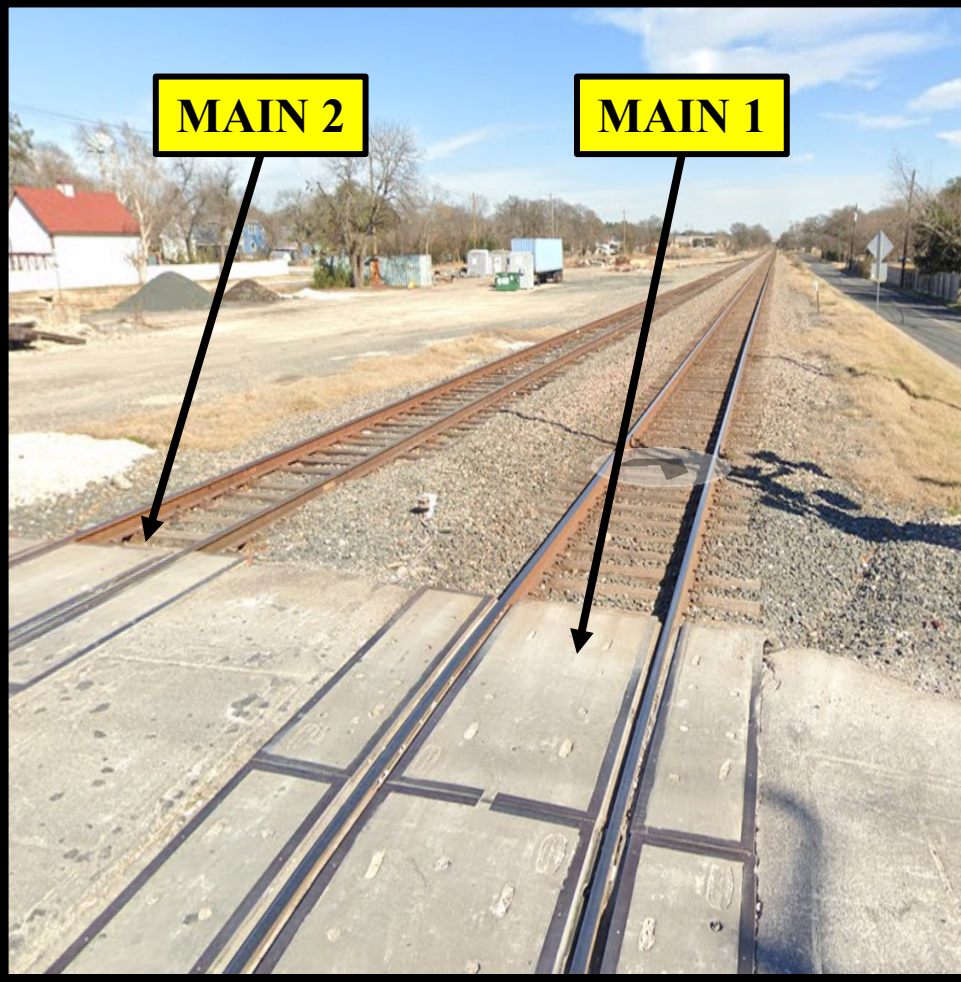
Which side of the track does the work group place their Conditional Stop Red Boards if they affect Main 1 only?

COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST



WEST



COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST

WEST

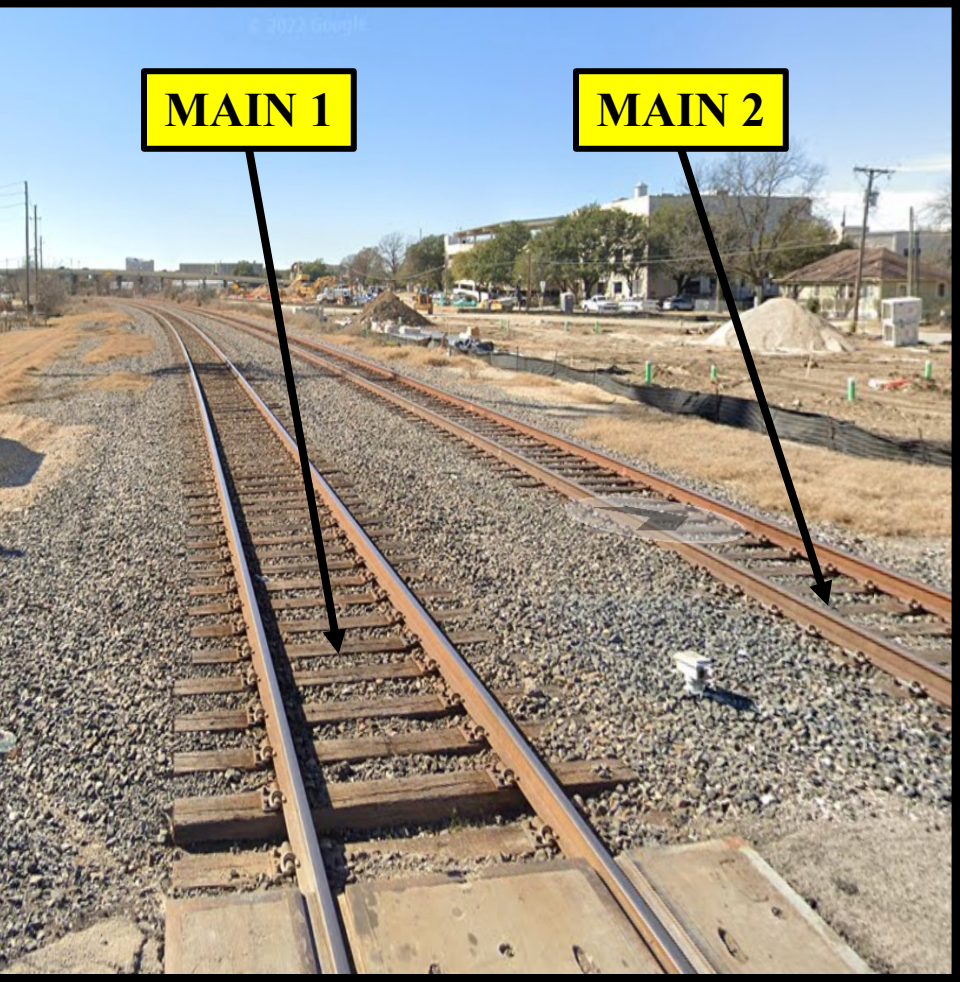
COMPLEX PROTECTION ENVIRONMENTS - PART 02

QUESTION:

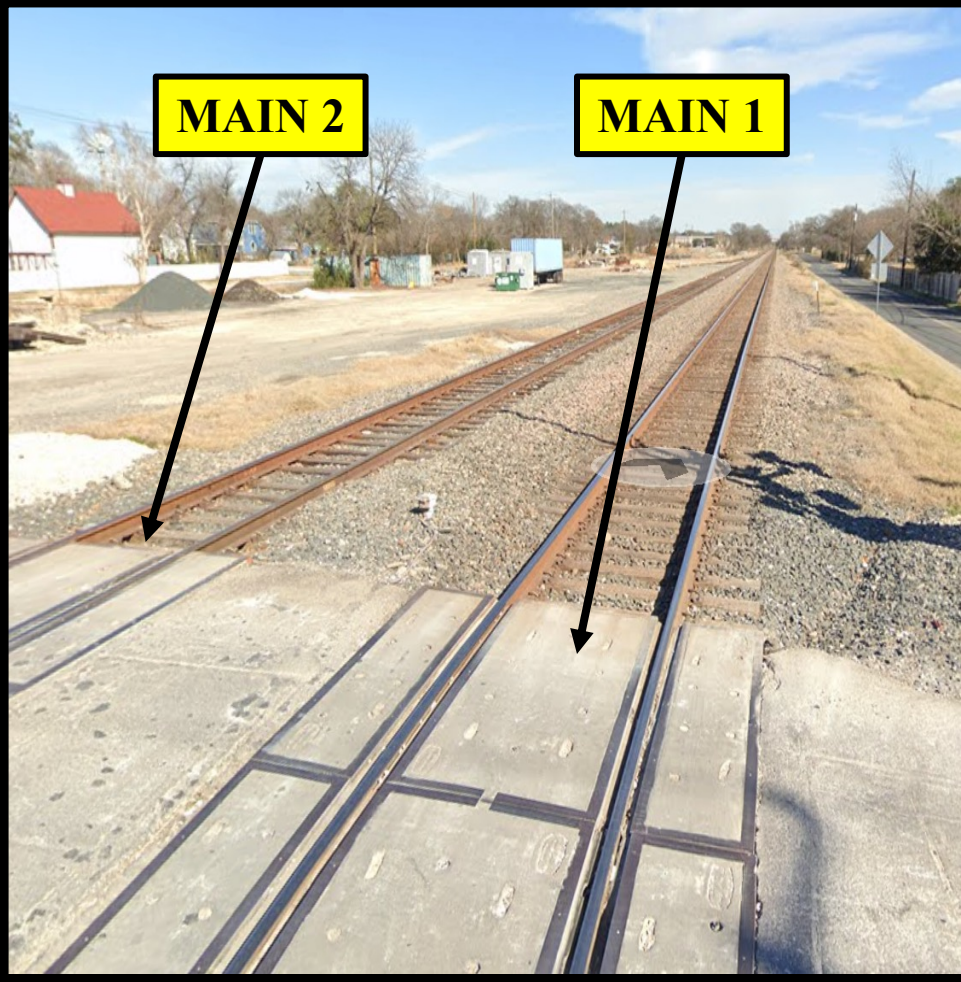
Which side of the track does the work group place their Conditional Stop Red Boards if they affect Main 2 only?

COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST



WEST



COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST

WEST

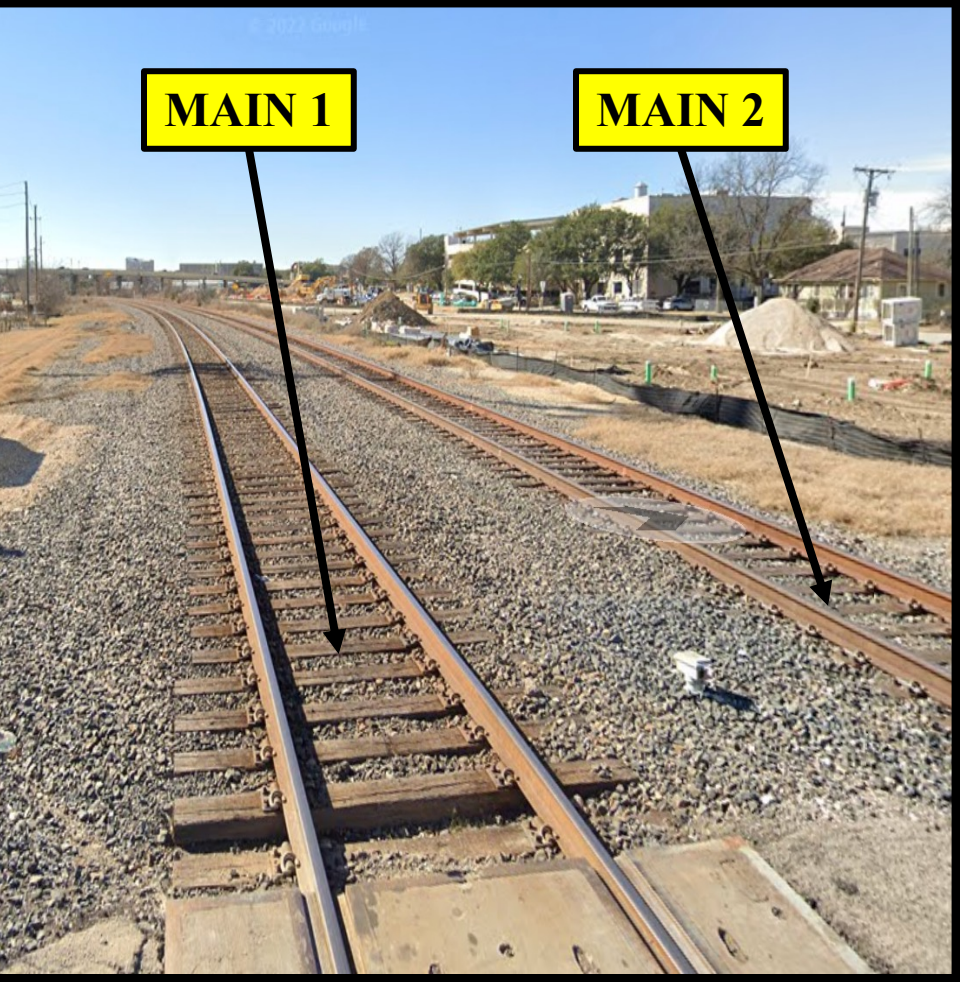
COMPLEX PROTECTION ENVIRONMENTS - PART 02

QUESTION:

Which side of the track does the work group place their Conditional Stop Red Boards if they affect Main 1 and Main 2?

COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST



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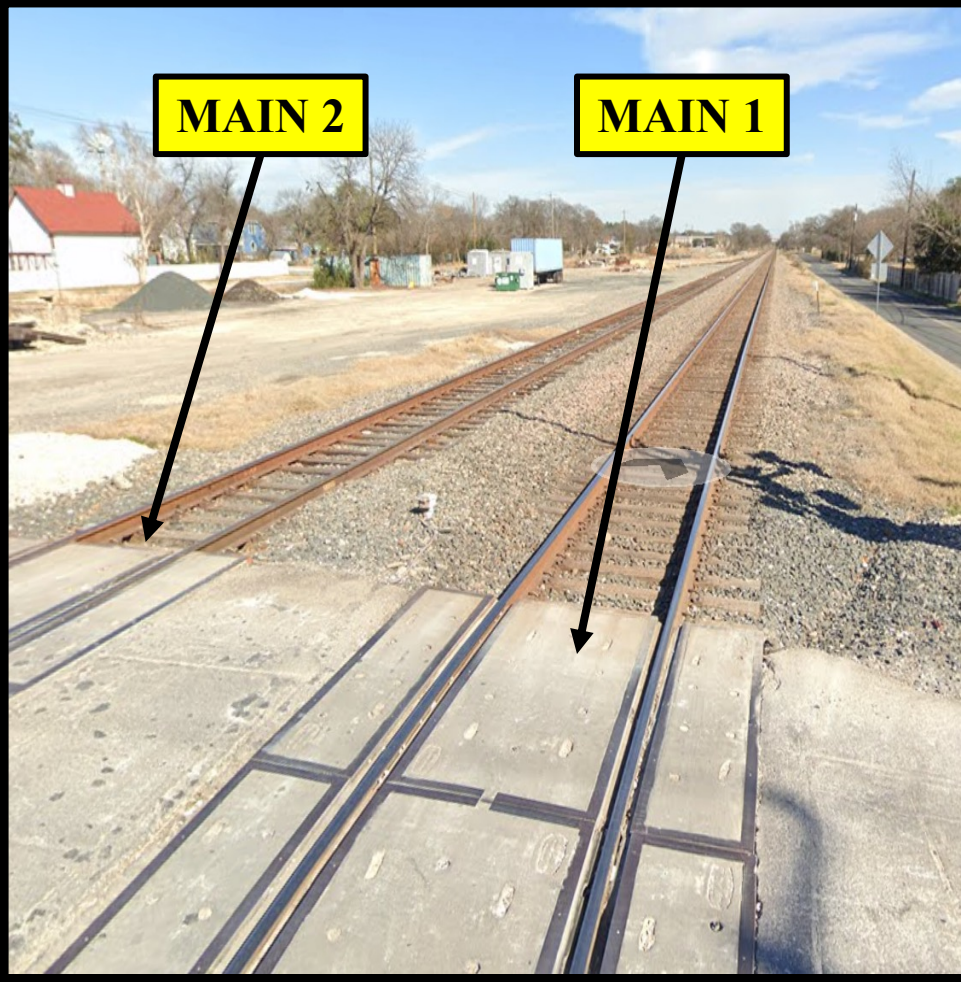
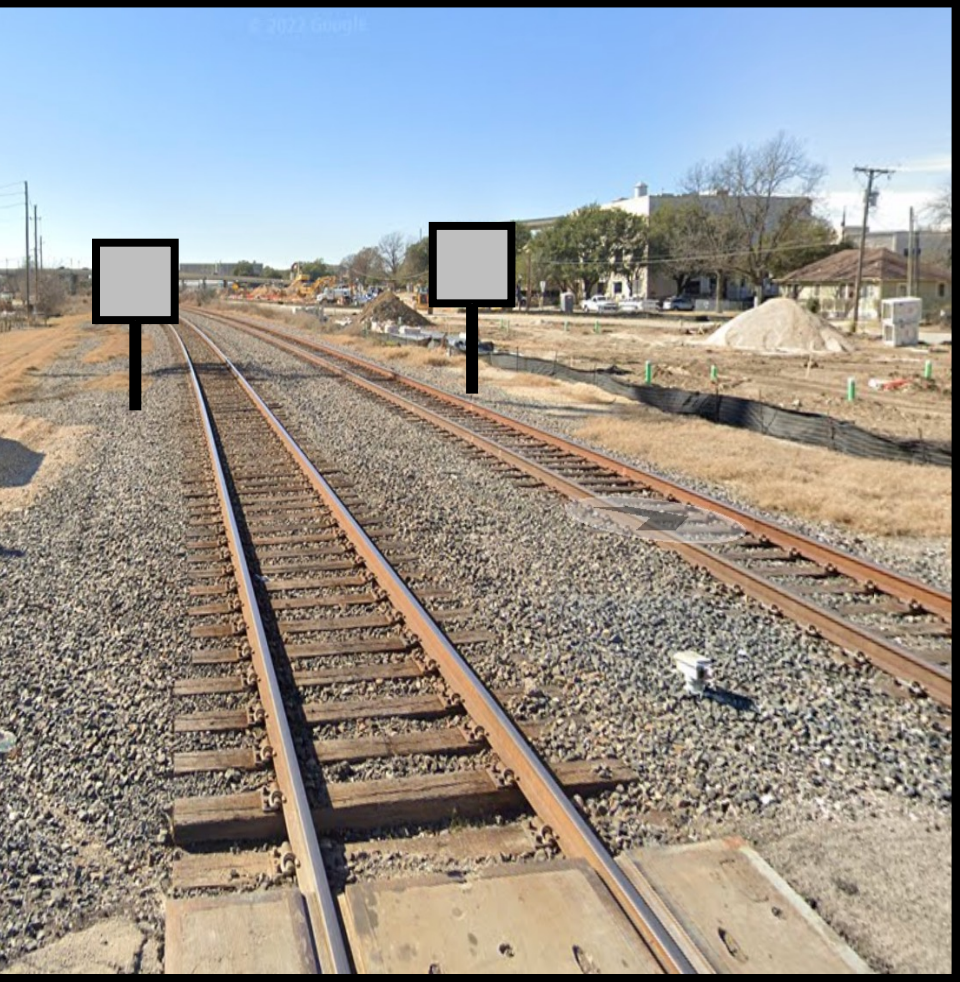
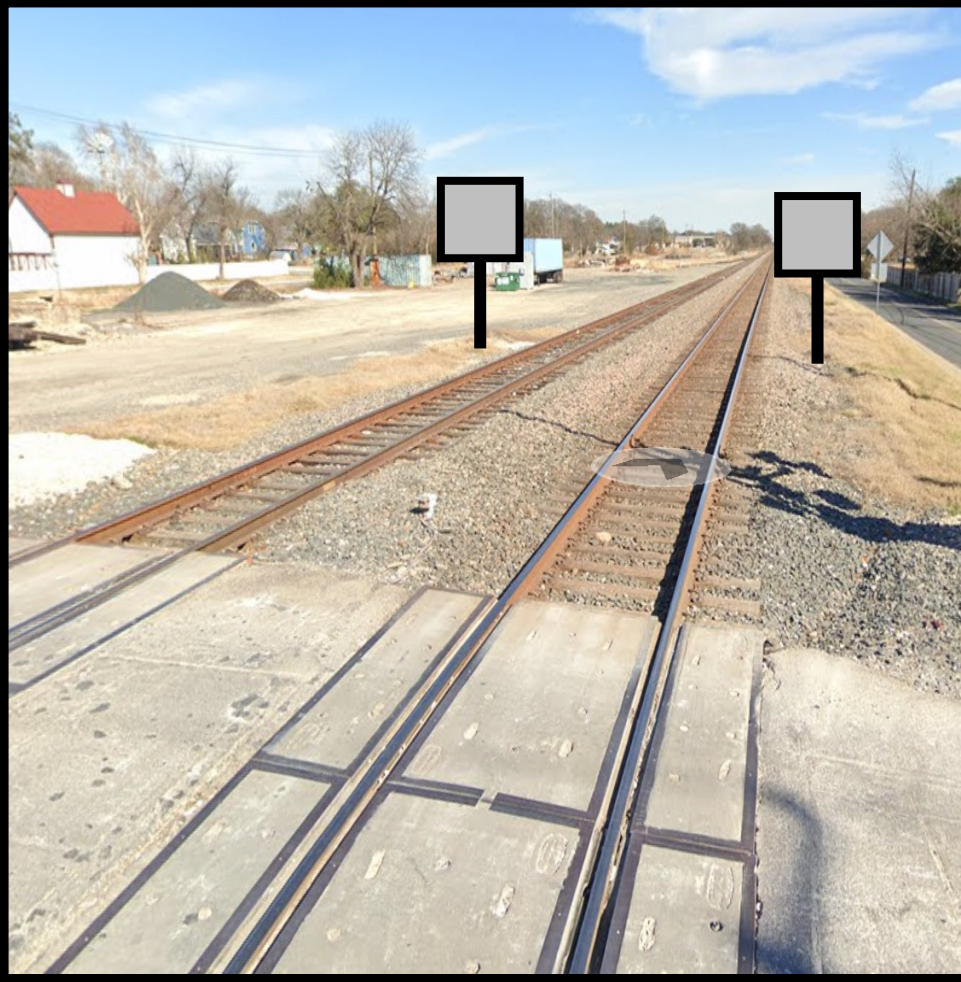


COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST



WEST



ANSWER 01:

The Conditional Stop Red Boards will always go on the field side of the tracks no matter which way you are facing in double main track territory (permitting there are no obstructions).

ANSWER 02:

Likewise, the Conditional Stop Red Boards will always face away from you regardless how many tracks are involved.

ANSWER 03:

One exception you will find is if your working limits are wider than the crossing with which you are working, i.e. you place boards at another crossing. That being said, the same principles apply, however, care should be taken with regards to situational awareness.

ANSWER 04:

Another exception you will find is if there is sufficient separation between the two tracks, both boards should be placed on the left hand side of the tracks regardless which direction you are facing.

BONUS QUESTION

QUESTION:

Which side of the track does the work group place their Conditional Stop Red Boards if they affect Main 1 and Main 2?

COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST

COMPLEX PROTECTION ENVIRONMENTS - PART 02

EAST

COMPLEX PROTECTION ENVIRONMENTS - PART 02

WEST

COMPLEX PROTECTION ENVIRONMENTS - PART 02

WEST

COMPLEX PROTECTION ENVIRONMENTS - PART 02

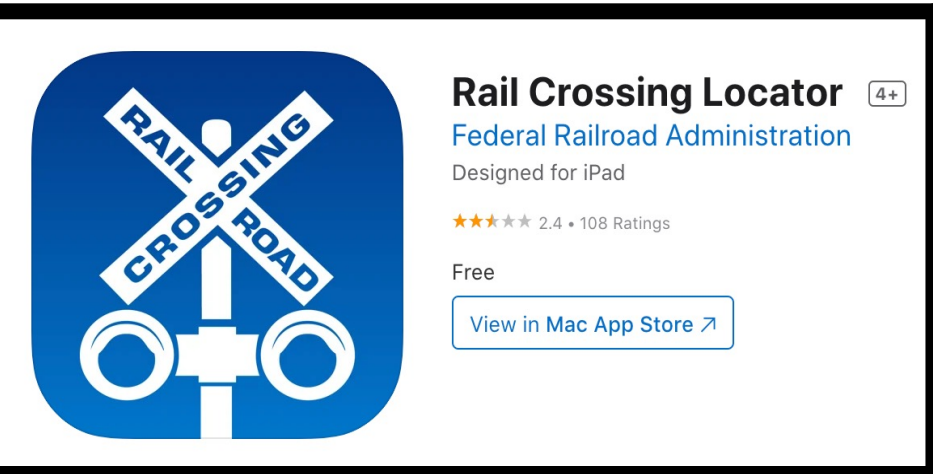
BEST PRACTICE 01:

Utilize the tools that are available to you to make your life easier. Leverage GIS Systems, Track Charts, etc. to identify Working Limits and ideal board placement.

BEST PRACTICE

BEST PRACTICE 02:

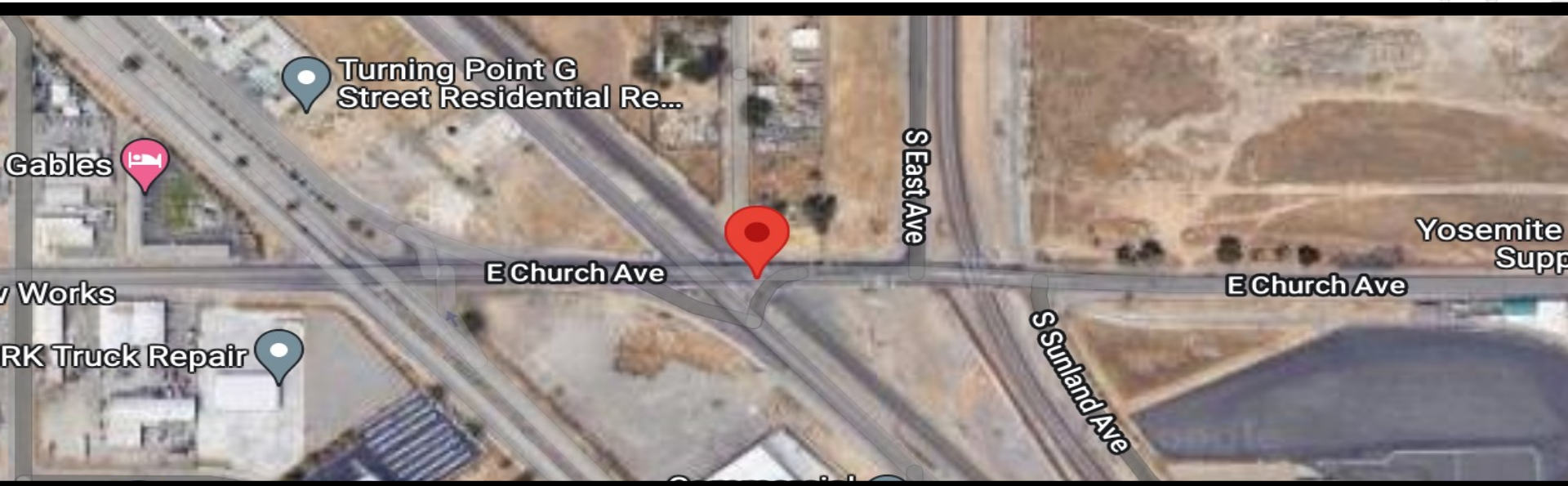
Leverage the FRA Rail Crossing Locator App.



BEST PRACTICE

BEST PRACTICE 03:

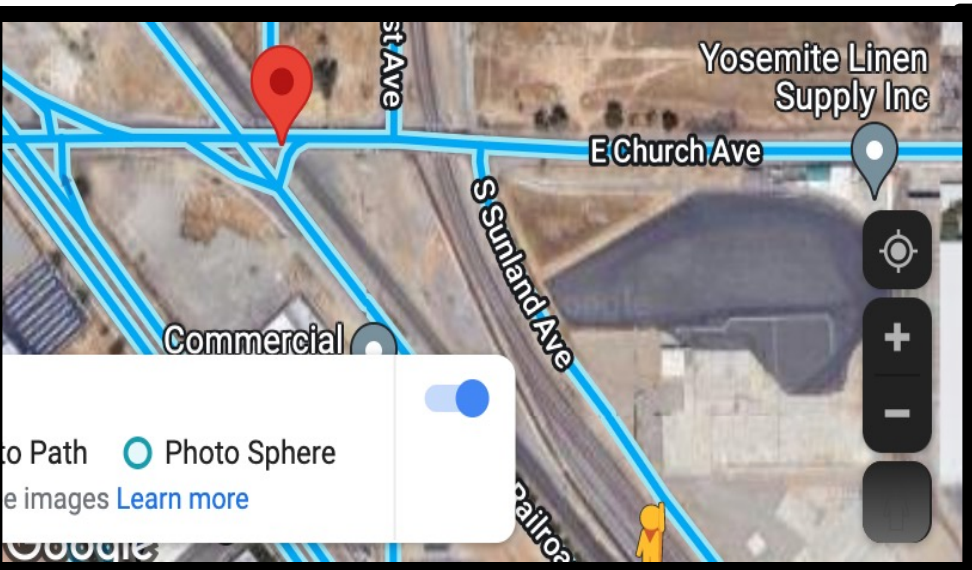
Leverage Satellite Imaging.



BEST PRACTICE

BEST PRACTICE 04:

Leverage Google Maps Street View.



Drag and drop anywhere blue.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 03

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SCENARIO:

A work group is performing minor maintenance and has elected to utilize Train Approach Warning as their method of On-Track Safety.

COMPLEX PROTECTION ENVIRONMENTS - PART 03

QUESTION:

When utilizing Train Approach Warning, what are common methods for a Watchman/Lookout to provide warning to workers of approaching movement?

COMPLEX PROTECTION ENVIRONMENTS - PART 03

FLAG

LANTERN

COMPLEX PROTECTION ENVIRONMENTS - PART 03

WHISTLE

AIR HORN

QUESTION:

Would it be advisable for a work group to utilize Train Approach Warning near a school?

COMPLEX PROTECTION ENVIRONMENTS - PART 03

ANSWER 01:

That would largely depend if school is in session. If in session, it would not be advisable to utilize Train Approach Warning due to ambient noise, (i.e. whistles on a playground).

QUESTION:

Would it be advisable for a work group to utilize Train Approach Warning near a sporting arena?

COMPLEX PROTECTION ENVIRONMENTS - PART 03

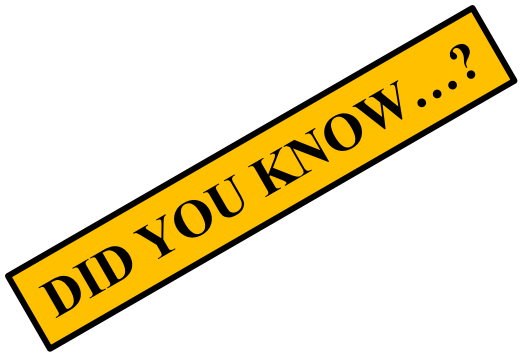
ANSWER 01:

That would largely depend if the sporting arena is actively being utilized. If in use, it would not be advisable to utilize Train Approach Warning due to ambient noise, (i.e. whistles or air horns in use by referees).

COMPLEX PROTECTION ENVIRONMENTS - PART 03

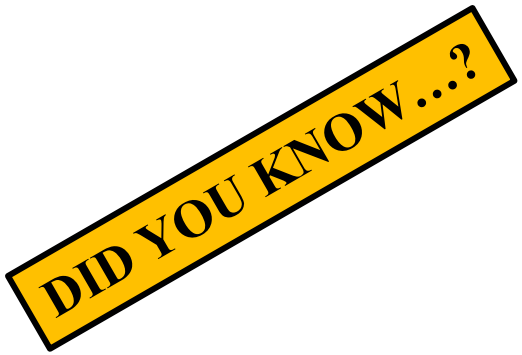
BEST PRACTICE 01:

Always be cognizant of your environment. Albeit the occasional whistle or air horn going off may not seem like an issue at first, remember the story of the little boy who cried wolf. Whether you realize it or not, you may inadvertently ignore the real warning provided by your Watchman/Lookout.



DID YOU KNOW…

Approximately 14% of all Construction Workers have hearing difficulty? (Railroad Workers fall in this category as well)



DID YOU KNOW…

Some people with hearing loss experience unilateral hearing loss or single-sided deafness? Hearing loss in one ear presents unique challenges, such as difficulty locating sounds, disorientation in crowds, off-kilter volume detection, or higher-pitched sounds being muffled.

BEST PRACTICE

BEST PRACTICE 02:

Always test your workers ability to clear tracks before the train arrives. It is better to identify that Train Approach Warning won't work in a controlled environment rather than when a train is barreling towards your work group.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 04

COMPLEX PROTECTION ENVIRONMENTS - PART 04

SCENARIO:

A Track Inspector is inspecting track by foot and has elected to utilize Individual Train Detection as the method of On-Track Safety.

QUESTION:

How does the Track Inspector identify the required sight distance?

ANSWER 01:

The Track Inspector must first identify the maximum authorized track speed. Next, they must identify how much time is necessary to clear the tracks. Lastly, they must calculate the required sight distance.

BEST PRACTICE

BEST PRACTICE 01:

When identifying required sight distance, use a speed distance table to simplify your calculation.

OLD SIGHT DISTANCE TABLE

Speed (MPH)	Distance (Ft)	Speed (Ft)	Distance (Ft)
5	110	35	770
10	220	40	880
15	330	45	990
20	440	50	1,100

NEW SIGHT DISTANCE TABLE

Authorized Track Speed	Distance Train Travels in 15 Seconds	10 Seconds Clearing Time	15 Seconds Clearing Time	20 Seconds Clearing Time
10	220	367	440	513
20	440	733	880	1027
25	550	917	1100	1283

QUESTION:

How does the Track Inspector identify that the required sight distance actually exists?

ANSWER 01:

The Track Inspector can use a measuring wheel, rangefinder, track charts, railroad identifiable points, etc.

BEST PRACTICE

BEST PRACTICE 01:

Leverage alternate identifiable points.

QUESTION:

May the Track Inspector utilize Individual Train Detection when fog or other inclement weather conditions are present?

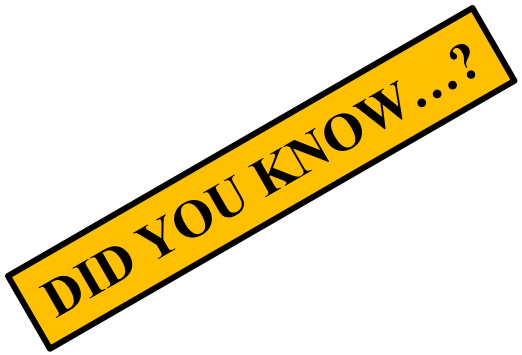
ANSWER 01:

The Track Inspector must establish some other means of On-Track Safety.

BEST PRACTICE

BEST PRACTICE 01:

When utilizing Individual Train Detection or Train Approach Warning, always remain cognizant of environmental conditions. While sight distance may exist this very moment, fog is not stationary and may move closer at any moment, ergo sight distance could disappear unexpectedly.



DID YOU KNOW…

Of the 55 Roadway Worker fatalities analyzed by FAMES, 13 accidents resulting in 16 fatalities occurred where TAW was being used?

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 05

COMPLEX PROTECTION ENVIRONMENTS - PART 05

SCENARIO:

A Track Inspector is training an Apprentice on how to inspect track. In turn, the Track Inspector must teach the Apprentice the fundamentals of On-Track Safety.

QUESTION:

What are the most common methods of On-Track Safety that a Track Inspector should teach an Apprentice?

COMPLEX PROTECTION ENVIRONMENTS - PART 05

TRACK AUTHORITY

TRACK WARRANT

NO: _____ _____

TO: _____

1. ☐ TRACK WARRANT NO. _____ IS VOID.
2. ☐ PROCEED FROM _____ TO _____ ON _____ TRACK.
3. ☐ PROCEED FROM _____ TO _____ ON _____ TRACK.
4. ☐ WORK BETWEEN _____ AND _____ ON _____ TRACK.
5. ☐ NOT IN EFFECT UNTIL _____.
6. ☐ THIS AUTHORITY EXPIRES AT _____.
7. ☐ NOT IN EFFECT UNTIL AFTER ARRIVAL OF _____ AT _____.
8. ☐ HOLD MAIN TRACK AT LAST NAMED POINT.
9. ☐ DO NOT FOUL LIMITS AHEAD OF _____.
10. ☐ CLEAR MAIN TRACK AT LAST NAMED POINT.
11. ☐ BETWEEN _____ AND _____ MAKE ALL MOVEMENTS AT RESTRICTED SPEED. LIMITS OCCUPIED BY TRAIN.
12. ☐ BETWEEN _____ AND _____ MAKE ALL MOVEMENTS AT RESTRICTED SPEED. LIMITS OCCUPIED BY MEN OR EQUIPMENT.
13. ☐ DO NOT EXCEED _____ MPH BETWEEN _____ AND _____.
14. ☐ DO NOT EXCEED _____ MPH BETWEEN _____ AND _____.
15. ☐ FLAG PROTECTION NOT REQUIRED AGAINST FOLLOWING TRAINS ON THE SAME TRACK.
16. ☐ TRACK BULLETINS IN EFFECT _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____.
17. ☐ OTHER SPECIFIC INSTRUCTIONS: _____

OK _____ (TIME) DISPATCHER _____

LIMITS REPORTED CLEAR AT _____

(Mark the box for each item instructed.)

INACCESSIBLE TRACK

COMPLEX PROTECTION ENVIRONMENTS - PART 05

INDIVIDUAL TRAIN DETECTION

TRAIN APPROACH WARNING

QUESTION:

How does the Track Inspector teach the Apprentice the fundamentals of Individual Train Detection?

ANSWER 01:

The Track Inspector can only teach the Apprentice Individual Train Detection in theory. While they can practice the role of a Lone Worker and practice completing a Statement of On-Track Safety form, they must have other protection as they are a Roadway Work Group.

QUESTION:

How does the Track Inspector teach the Apprentice the fundamentals of Train Approach Warning?

ANSWER 01:

The Track Inspector can only teach the Apprentice Train Approach Warning in theory. While they can practice the role of a Watchman/Lookout, they must have other protection as the Track Inspector cannot observe the Apprentice if they themselves are actively working as the Watchman/Lookout.

QUESTION:

How does the Track Inspector teach the Apprentice the fundamentals of Inaccessible Track by means of portable derails?

ANSWER 01:

The Track Inspector can only teach the Apprentice Inaccessible Track by means of portable derails in theory. While they can discuss the application of portable derails, they must have other protection as the Track Inspector cannot observe the Apprentice if they are actively working as the Watchman/Lookout.

BEST PRACTICE 01:

When training an Apprentice, obtain Positive Protection (i.e. Track Authority, Inaccessible Track by means of switches, etc.) so that you can practice ITD and TAW safely and in a controlled environment. Alternately, incorporate a third person into the mix who can act as the Watchman/Lookout.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 06

COMPLEX PROTECTION ENVIRONMENTS - PART 06

SCENARIO:

A Track Inspector and a Helper need to change out defective rail in a yard and have elected to utilize Inaccessible Track by means of portable derails as their method of On-Track Safety.

QUESTION:

How does the Track Inspector and Helper accomplish establishing protection?

ANSWER 01:

The Track Inspector and Helper must work together to establish On-Track Safety as they are a Roadway Work Group.

BEST PRACTICE

BEST PRACTICE 01:

When setting up Inaccessible Track, always work together. Albeit faster to divide and conquer, it is technically in violation of the rules as two workers working together on a common task cannot work as Lone Workers.

BEST PRACTICE 02:

Remember, the derail is not providing any means of On-Track Safety until it is applied correctly. In other words, you need protection during the installation/removal process itself.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 07

COMPLEX PROTECTION ENVIRONMENTS - PART 07

SCENARIO:

A maintenance gang needs to perform track maintenance on a non-controlled siding and has elected to utilize Inaccessible Track by means of portable derails as their method of On-Track Safety.

QUESTION:

How far in advance must portable derails be placed from men and equipment?

ANSWER 01:

Typically, a minimum of 150 Feet.

(However individual railroad RWP Rules may vary)

QUESTION:

If the non-controlled siding were on a 2% grade, would that affect the placement of the derail?

ANSWER 01:

It would most certainly affect the location of the derail. The derail should be placed a minimum of 150 Feet from men and equipment, however, there is no maximum.

BEST PRACTICE 01:

It is imperative to understand what track speed the derail is rated for and what track speed the derail may be subjected to. While the derail may be rated for 15mph track and the track itself may have a maximum operating speed of 10mph, that does not mean that the derail will not be subjected to greater speeds.

BEST PRACTICE

BEST PRACTICE 02:

It is imperative to understand where parked cars are located in proximity to men and equipment and an estimation of velocity needs to be identified in the event that brakes were to fail. The 150 Feet minimum should be increased if any parked cars have the potential to reach higher speeds in the event of brake failure.

FRA TRACK & RAILROAD WORKPLACE SAFETY SYMPOSIUM

COMPLEX PROTECTION ENVIRONMENTS - PART 08

SCENARIO:

A Track Inspector is performing a special inspection due to severe rain and has elected to obtain a Track Authority as the method of On-Track Safety.

QUESTION:

How would the Track Inspector protect a maintenance gang wishing to enter Working Limits?

ANSWER 01:

The Track Inspector would establish Joint Occupancy and grant the other maintenance gang authority into Working Limits.

COMPLEX PROTECTION ENVIRONMENTS - PART 08

QUESTION:

Does this need to be documented anywhere?

ANSWER 01:

Generally, the Track Inspector should be required to document any Joint Occupancy issued to another work group on the Track Authority form itself.

BEST PRACTICE 01:

It is imperative to not forget about other work groups granted authorization into Working Limits. That being said, it is advisable to utilize various visual cues to serve as reference to commitments made.

EXAMPLE TRACK WARRANT

Engineering Department

TRACK WARRANT FORM

NUMBER NRSS 0123 DATE: 03/24/2022

TO: RWIC Shepherd AT: MP 123.4

1 ☐ TRACK WARRANT NO. _____ IS VOID.

2 ☐ PROCEED FROM: _____ TO: _____ ON: _____

4 ☒ WORK BETWEEN: MP 120.0 AND: MP 130.0 ON: Main Track

7 ☐ NOT IN EFFECT UNTIL AFTER THE ARRIVAL OF: _____ AT: _____

8 ☐ HOLD THE MAIN TRACK AT LAST NAMED POINT.

9 ☐ DO NOT FOUL THE LIMITS AHEAD OF: _____

10 ☐ CLEAR THE MAIN TRACK AT THE LAST NAMED POINT.

11 ☐ BETWEEN: _____ & _____ MAKE ALL MOVEMENTS AT RESTRICTED SPEED, LIMITS ARE OCCUPIED BY TRAIN.

12 ☐ BETWEEN: _____ & _____ MAKE ALL MOVEMENTS AT RESTICTED SPEED, LIMITS ARE OCCUPIED BY: _____

16 ☒ TRACK BULLETINS IN EFFECT: 7 / / / / / / .

17 ☐ OTHER SPECIFIC INSTRUCTIONS: _____

18 ☐ EXPECT TO FIND THE FOLLOWING SWITCH(ES) LINED AND LOCKED IN THE REVERSE POSITION: _____

19 ☐ THE FOLLOWING SWITCHES MAY BE LEFT LINED AND LOCKED IN THE REVERSE POSITION: _____

THIS TRACK WARRANT HAS: 2 BOXES MARKED.

THEY ARE BOX NUMBERS: 4 / 16 / / / / / / / / / /

OK TIME: 7:27 DISPATCHER: ABC COPIED BY: ACS

LIMITS REPORTED CLEAR AT: _____ BY: _____

TM1109

DOB Verification

DOB # 7 Time 6:55 Dspr ABC

Subdivision: NRSS

Initials of Others at Work Location

Mainline Switch Position Awareness

Location	Time Rvsd	Time Nrml	Time Int

Miscellaneous Note:

Dispatcher:

Joint Occupancy

EIC Name	Begin Limit	End Limit	Time Authorized	Time Released

Train Past Initial Occupancy Location

Location	Time Past Location	Visual	Dispatcher	Train Crew

EXAMPLE TRACK WARRANT

Engineering Department

TRACK WARRANT FORM

NUMBER NRSS 0123 DATE: 03/24/2022

TO: RWIC Shepherd AT: MP 123.4

1 ☐ TRACK WARRANT NO. _____ IS VOID.

2 ☐ PROCEED FROM: _____ TO: _____ ON: _____

4 ☒ WORK BETWEEN: MP 120.0 AND: MP 130.0 ON: Main Track

7 ☐ NOT IN EFFECT UNTIL AFTER THE ARRIVAL OF: _____ AT: _____

8 ☐ HOLD THE MAIN TRACK AT LAST NAMED POINT.

9 ☐ DO NOT FOUL THE LIMITS AHEAD OF: _____

10 ☐ CLEAR THE MAIN TRACK AT THE LAST NAMED POINT.

11 ☐ BETWEEN: _____ & _____ MAKE ALL MOVEMENTS AT RESTRICTED SPEED, LIMITS ARE OCCUPIED BY TRAIN.

12 ☐ BETWEEN: _____ & _____ MAKE ALL MOVEMENTS AT RESTICTED SPEED, LIMITS ARE OCCUPIED BY: _____

16 ☒ TRACK BULLETINS IN EFFECT: 7 _____ / _____ / _____ / _____ / _____ / _____ / _____.

17 ☐ OTHER SPECIFIC INSTRUCTIONS: _____

18 ☐ EXPECT TO FIND THE FOLLOWING SWITCH(ES) LINED AND LOCKED IN THE REVERSE POSITION: _____

19 ☐ THE FOLLOWING SWITCHES MAY BE LEFT LINED AND LOCKED IN THE REVERSE POSITION: _____

THIS TRACK WARRANT HAS: 2 BOXES MARKED.

THEY ARE BOX NUMBERS: 4 / 16 / _____ / _____ / _____ / _____ / _____ / _____ / _____ / _____ /

OK TIME: 7:27 DISPATCHER: ABC COPIED BY: ACS

LIMITS REPORTED CLEAR AT: _____ BY: _____

TM1109

DOB Verification

DOB # 7 Time 6:55 Dspr ABC

Subdivision: NRSS

Initials of Others at Work Location

SECTION TO BE COMPLETED

Miscellaneous Note:

Dispatcher:

Joint Occupancy

EIC Name	Begin Limit	End Limit	Time Authorized	Time Released

Train Past Initial Occupancy Location

Location	Time Past Location	Visual	Dispatcher	Train Crew

BEST PRACTICE 02:

When completing the Joint Occupancy section of a respective Track Authority, complete said section in Blue or Red ink so that it stands out vividly on the page. Alternately, write all Joint Occupancy granted on your windshield to ensure no work group is forgotten.

COMPLEX PROTECTION ENVIRONMENTS - END

AS PRESENTED BY:

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Fax (513) 779-8428
ashepherd@nrssinc.net
www.nrssinc.net

- COMPLEX PROTECTION ENVIRONMENTS -

THANK YOU